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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,689	09/27/2001	Shunpei Yamazaki	07977/286001/US5247	5005

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EXAMINER	
CHEN, KIN CHAN	
ART UNIT	PAPER NUMBER
1765	11

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/966,689	Applicant(s) YAMAZAKI ET AL.
	Examiner Kin-Chan Chen	Art Unit 1765

-- The MAILING DATE of this communication app ars on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *1-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5,9* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 15-25 and adding new claims 26-28 in Paper No. 10 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 15-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susko et al. (US 4,885,074; hereinafter "Susko") in view of Sill et al. (US 6,431,112 B1; hereinafter "Sill").

Susko teaches an etching method using a dry etching apparatus provided with a first electrode and a second electrode opposed to each other. A substrate may be disposed on the second electrode comprising a plurality of electrodes provided (being independent from each other, claims 22 and 26) in a chamber. A reaction gas may be supplied into the chamber. A first high-frequency power may be applied to an electrode disposed below a central portion of the substrate and a second high-frequency power may be applied to electrodes disposed below the edge portions of the substrate to

supply an AC electric field between the first electrode and the second electrode. The plasma may be generated (with a magnetic field or an electric field, claim 18) between the first electrode and the second electrode. A plurality of high power sources independently connected to each of the plurality of electrodes (claim 26). A material film on the substrate disposed on the second electrode may be etched. (col. 3, lines 32-54; col. 4, lines 16-32 and Figs 3-6; col. 5, lines 7-21). The wafer can be processed uniformly and the etching from the center of workpiece and the edges of workpiece has the same extent (col. 4, lines 30-32; col. 5, lines 18-20).

Susko discloses that the plasma reactor is capable of sustaining a vacuum (abstract). Susko does not explicitly state supplying a reaction gas into the chamber under a reduced pressure. However, it is conventional for the plasma etching process. Sill is relied on to show that in the plasma processing (e.g., plasma etching), a reaction gas is supplied into the chamber under a reduced pressure (under vacuum) (col. 5, lines 33-37, lines 53-62). Because it is a conventional method in the art of plasma etching and because it is disclosed by Sill, hence, it would have been obvious to one with ordinary skill in the art to perform said process step of Susko under reduced pressure as taught by Sill in order to provide their art recognized advantages and produce an expected result.

Susko teaches that the workpiece can be a semiconductor device or any structure to be etched. Susko is not particular about the shape or structure of the workpiece, therefore, it would have been obvious to one with ordinary skill in the art to use workpiece with conventional shapes (e.g., round, rectangular, or square

substrates). Hence, the edges of the substrate comprise the corner portions of the substrates, as instantly claimed, wherein the electrodes may be disposed.

As to dependent claim 16, Susko teaches using the first high-frequency power and the second high-frequency power. Susko does not disclose the frequency used in its process. It would be obvious to one skilled in the art to use standard13.56 MHz frequency (see El-kareh (FSPT, p. 285) in the record as evidence) for both power sources because it is extra cost without benefit to use different frequencies for power sources.

As to claim 20, Susko teaches that the workpiece can be a semiconductor device or any structure to be etched. Susko is not particular about the structure of the workpiece being etched, therefore, it would have been obvious to one with ordinary skill in the art to use workpiece with conventional wiring structure of semiconductor device, such as a conductive film formed on the substrate with a mask formed on the conductive film. Hence, it would have been obvious to one with ordinary skill in the art to perform said process steps of Susko in the conventional wiring structure in order to provide their art recognized advantages and produce an expected result.

Claims 17, 19, 21, 23, 25, and 28 differ from the prior art by teaching various features well known to the art of semiconductor device fabrication (such as dry etching apparatus in claims 17, 19, and 23; wiring type in claim 21; electronic devices applications in claims 25 and 28). It is the examiner's position that a person having ordinary skill in the art at the time of the instantly claimed invention would have found it obvious to modify Susko and Sill by adding any of same well-known features to same

because these features would have been anticipated to provide their art recognized advantages and thus produce an expected result.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. El-Kareh, Fundamentals of Semiconductor Processing Technologies (FSPT), page 285, teaches that frequency typically 13.56 MHz is used in plasma etching system.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K-C C
October 24, 2002

Patent Examiner
Group Art Unit 1765